

Application No. 10/050,346

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

- 1    1. (currently amended) A method of classifying media comprising:
  - 2           generating a probabilistic input-output system having at least
  - 3           two input parameters and having an output which has a joint dependency on
  - 4           said input parameters, said input parameters being associated with image-
  - 5           related measurements acquired from imaging textural features which are
  - 6           characteristic of different classes of media, said output being an identification
  - 7           of a media class;
  - 8                 imaging a medium of interest to acquire image information
  - 9                 regarding textural features of said medium of interest, said textural features
  - 10          being related to structure of said medium of interest;
  - 11                determining said image-related measurements from said image
  - 12          information; and
  - 13                employing said probabilistic input-output system to associate
  - 14          said medium of interest with a selected said media class, including using said
  - 15          image-related measurements determined from said image information as said
  - 16          input parameters; wherein generating said probabilistic input-output system
  - 17          includes:
  - 18                 imaging a plurality of samples of each of said media
  - 19                 classes;
  - 20                 calculating said image-related measurements for each of
  - 21                 said samples that are imaged;
  - 22                 on a basis of said input parameters that are associated
  - 23                 with said image-related measurements, mapping each said sample in a
  - 24                 multi-dimensional data distribution to form a cluster-weighted model
  - 25                 (CWM) in which joint probability densities established by said mapping
  - 26                 are used to define probability clusters within said data distribution; and
  - 27                 associating said probability clusters with said media
  - 28                 classes.

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1    2. (original) The method of claim 1 wherein generating said probabilistic  
2    input-output system includes relating texture-dependent vectors (x) to media-  
3    identification outputs (y), said input parameters being parameters of said  
4    texture-dependent vectors.

1    3. (original) The method of claim 2 wherein generating said probabilistic  
2    input-output system includes using mean values ( $\mu$ ) of the reflectivities of said  
3    medium classes and standard deviations ( $\sigma$ ) of said reflectivities as said input  
4    parameters.

1    4. (previously presented) The method of claim 1 further comprising setting  
2    print parameters for applying print material on said medium of interest,  
3    including basing settings of said print parameters on said output of said  
4    probabilistic input-output system.

1    5. (cancelled)

1    6. (currently amended) The method of claim 1 ~~claim 5~~ wherein said  
2    associating said probability clusters includes forming a look-up table which  
3    correlates said probability clusters with said media classes, said media  
4    classes including at least one type of paper.

1    7. (previously presented) The method of claim 1 wherein said imaging  
2    includes projecting light onto said medium of interest at an angle of less than  
3    45 degrees relative to an imaged surface of said medium of interest.

1    8. (previously presented) The method of claim 7 wherein said imaging further  
2    includes detecting surface features having dimensions of 100  $\mu\text{m}$  or less.

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1       9. (previously presented) The method of claim 1 wherein said imaging  
2       includes projecting light onto said medium of interest at an angle greater than  
3       45 degrees relative to an imaged surface of said medium of interest, said  
4       image-related measurements being specular measurements.

1       10. (withdrawn) A system for classifying media comprising:  
2                          memory having storage of cluster-weighted modeling (CWM)  
3       data indicative of correlations between reference texture-dependent vectors  
4       (x) and media identifications (y), said texture-dependent vectors being  
5       indicative of characteristic surface textures for various media;  
6                          a media storage and dispensing system configured to store and  
7       to manipulate said various media;  
8                          an imager positioned with respect to said media storage and  
9       dispensing system to capture image information of media stored and manipu-  
10      lated thereby;  
11                         a processor configured to manipulate said image information to  
12      derive texture-dependent vectors specific to said media; and  
13                         a print selection controller cooperative with said processor and  
14      said memory to select particular print parameters on a basis of correlations  
15      between said derived texture-dependent vectors and said reference texture-  
16      dependent vectors, said particular print parameters being specific to recording  
17      marks on said media.

1       11. (withdrawn) The system of claim 10 wherein said imager is disposed to  
2       image said media within a tray of said media storage and dispensing system.

1       12. (withdrawn) The system of claim 10 wherein said imager has a resolution  
2       sufficient to detect surface features that are characteristics of said media.

1       13. (withdrawn) The system of claim 10 wherein said processor is configured  
2       to determine mean values and standard deviation values from said image  
3       information.

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1    14. (withdrawn) The system of claim 10 further comprising a printing system  
2    for recording said marks on said media in response to said print selection  
3    controller.

1    15. (withdrawn) A print system comprising:  
2                 a media tray for retaining recording media at a start of a feed  
3    path;  
4                 a media feed mechanism that defines said feed path for travel of  
5    any one of a plurality of recording media types;  
6                 a print device to record marks on said recording media traveling  
7    along said feed path;  
8                 a print controller connected to said print device to select partic-  
9    ular print parameters based on said recording media types; and  
10                a media classifier enabled to distinguish said recording media  
11    types, said media classifier including an imager disposed relative to said  
12    media tray and said media feed mechanism to capture image information and  
13    including at least one illumination source having an incidence angle of less  
14    than 46 degrees relative to a surface of a recording medium from which said  
15    image information is captured, said media classifier having an output  
16    connected to said print controller.

1    16. (withdrawn) The print system of claim 15 wherein said media classifier  
2    includes a plurality of said illumination sources having different wavelength  
3    centers.

1    17. (withdrawn) The print system of claim 16 wherein said media classifier  
2    includes a sequencer to sequentially activate said illumination sources, said  
3    illumination sources having differing incidence angles onto said recording  
4    medium.

1    18. (withdrawn) The print system of claim 15 wherein said media classifier  
2    includes a processor configured to derive texture-dependent vectors from said  
3    image information and to associate said texture-dependent vectors with  
4    probabilities of recording media types from which said image information is  
5    captured.

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1       19. (withdrawn) The print system of claim 18 wherein said media classifier  
2       includes memory having storage of cluster-weighted modeling which  
3       correlates said texture-dependent vectors to said probabilities of recording  
4       media types.

1       20. (withdrawn) The print system of claim 15 wherein said imager includes  
2       an array of photosensitive elements.

1       21. (currently amended) A method of performing media classification with  
2       respect to a plurality of different media classes, the method comprising:  
3                 acquiring statistics about surface textural features that are  
4       inherent to the different media classes; and  
5                 generating a probabilistic input-output system having at least  
6       two input parameters and having an output which has a joint probability  
7       density dependency on said input parameters, said input parameters being  
8       associated with the with said statistics, said output being an identification of a  
9       media class, including utilizing cluster-weighted modeling in implementing  
10      said probabilistic input-output system so as to define clusters which are  
11      subsets of data space according to domains of influence.

1       22. (currently amended) A method of classifying a medium of interest with  
2       respect to a plurality of different media classes, the medium having surface  
3       textural features that are inherent to the medium, the method comprising:  
4                 acquiring image information about the surface textural features  
5       inherent to said medium;  
6                 generating statistics about the surface textural features from the  
7       acquired information; and  
8                 using a probabilistic cluster-weighted input-output model to  
9       discriminate the medium against the media classes on a basis of matching  
10      said statistics to clusters which are subsets of data space according to  
11      domains of influence, including using the using said statistics as input  
12      parameters to the model, said discrimination of said medium having a joint  
13      probability density dependency on said statistics.

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- 1 23. (previously presented) A system for performing the method of claim 22.
  
- 1 24. (previously presented) A printer for performing the method of claim 22.